Health Assessment for

CHEMICAL LEAMAN TANK LINES, INC. (CLTL) NPL SITE

LOGAN TOWNSHIP, GLOUCESTER COUNTY, NEW JERSEY

Agency for Toxic Substances and Disease Registry
U.S. Public Health Service

SUMMARY

The Chemical Leaman Tank Lines, Inc. (CLTL) Site is a National Priorities List (NPL) Site located in Logan Township, Gloucester County, New Jersey. CLTL is a common carrier of bulk chemical commodities, some of which are hazardous. CLTL previously used several rinse water settling ponds and aeration lagoons as part of the cleaning and washing process for tank trailers. These ponds and lagoons have been removed; however, contamination from them has entered the underlying groundwater. The contamination has migrated off-site and impacted several nearby residential water supply wells. However, the affected residents were connected to the Bridgeport Municipal Water System in 1987. Previous sampling of the environmental media has indicated that exposure to contaminants from the groundwater and subsurface soils are the current identified exposure pathways of concern. On-site workers may be exposed to VOCs that are released to the ambient air from the on-site production well and from tank washing operations. Human exposure to on-site contaminants may also occur by inhalation and ingestion of contaminated subsurface soil particulates and dust during remedial or construction activities. Further investigations of the wetlands, sediments, and surface waters are to be conducted in the future.

BACKGROUND

A. SITE DESCRIPTION

The CLTL Site is located approximately one mile east of Bridgeport, New Jersey, and approximately two miles south of the Delaware River (see Appendix, Figure 1 and 2). A railroad borders the site to the north and separates the site from several homes. Great Cedar Swamp and Moss Branch border the site on the east and south, respectively. Oak Grove Road is along the western boundary of the site. The CLTL Site is composed of 31.4 acres. The western and northern boundaries are fenced; Cedar Swamp is a barrier to the south and east.

The CLTL is an active terminal used for the cleaning and maintenance of tractor and tank trailer equipment. The site houses a terminal building, tractor service bays and a truck washing area. The trailer interiors are washed in a recirculatory system with a solution of sodium hydroxide, sequestration agents, and defoaming agents. The trailers are then rinsed with water and the rinse water discharged to the rinse water treatment system. The rinse water treatment system formerly consisted of a series of unlined settling and aeration lagoons which contributed to the surface and groundwater contamination. These lagoons were drained and backfilled in 1977.

In 1982, the contaminated soil around the former settling lagoons and settling tank was excavated and sent to a disposal facility in Baltimore, Maryland. The excavated area was backfilled with sand and gravel.

The CHL Site was included on the NPL in 1985.

Currently, the tank trailer washing operations involve rinse water flowing to a 3,000 gallon underground settling tank. The rinse water is pumped to a 50,000 gallon above-ground holding tank equipped with an aerator. The rinse water is then loaded into empty tank trailers for eventual transport to an off-site treatment facility. Rinse water is provided from an on-site production well.

B. SITE VISIT

A site visit was deemed unnecessary for the preparation of this Health Assessment.

ENVIRONMENTAL CONTAMINATION AND PHYSICAL HAZARDS

A. ON-SITE CONTAMINATION

TABLE 1
ON-SITE GROUNDWATER CONTAMINATION
ppb, maximum

CONTAMINANT	
Trichloroethene	4800
Benzene	300
Vinyl chloride	8900
Trans-1,2-dichloroethene	69000
Chlorobenzene	600
Arsenic	1230
Chromium	690
Zinc	68500

ppb- Parts per billion
Sampling dates- June/September, 1986

B. OFF-SITE CONTAMINATION

TABLE 2
OFF-SITE PRIVATE WELL GROUNDWATER CONTAMINATION
ppb, maximum

CONTAMINANT	
Trichloroethene	260
Benzene	37
Vinyl chloride	1800
Trans-1,2-dichloroethene	1000
Chlorobenzene	13
Zinc	130

ppb- Parts per billion
Sampling dates- Since 1983

C. PHYSICAL HAZARDS

No physical hazards on the site were reported.

DEMOGRAPHICS

The population of Logan Township was listed at 3,078 in the 1980 census. The Township has approximately 15,000 acres. Agriculture accounts for about one-third of the land use and more than half is undeveloped marshes and woodlands. Approximately three percent of the Township is residential.

CLTL is in an area zoned for light industry. About 50 homes are within a one-half mile radius. The residences located near the site have individual potable water supply wells, although many have not been used for drinking water since contaminants were discovered in the water in the 1970's. During 1987, residences north of the site along Route 44 were connected to the Bridgeport Municipal Water System.

EVALUATION

A. SITE CHARACTERIZATION (DATA NEEDS AND EVALUATION)

1. Environmental Media:

Surface Water and Sediments: Data on surface water and sediment were not presented in the documents that were reviewed. The Revised Draft Remedial Investigation (RDRI) report noted that a second report on the wetland, surface water and sediment will be submitted in the future. An evaluation will be performed when further information is available. No data have been presented on bioaccumulation of contaminants in fish and other consumable wild plants, animals, crops and livestock.

Air: On-site and off-site ambient air monitoring data were not available for review. This data would be valuable in correlating the results of the preliminary soil gas survey and the various scenarios involving VOC releases from truck washing activities and from the washing process equipment.

2. Demographics and Land Use:

Although general demographic data were given in References 1 and 2, detailed demographic data were unavailable for our evaluation. Additional information with respect to the estimated population within a one-half mile radius that would be useful in our evaluation includes: the number and location of residences, locations of schools, hospitals, and population distribution by age, sex, socioeconomic status, ethnic background, and the occupations of employed persons.

3. Quality Control and Quality Assurance (QA/QC):

This Health Assessment was based on compiled data from the REVISED DRAFT REMEDIAL INVESTIGATION REPORT FOR CHEMICAL LEAMAN TANK LINES, INC., VOLUMES 1 AND 2, JUNE 7, 1988, and THE REVISED DRAFT RISK ASSESSMENT FOR CHEMICAL LEAMAN TANK LINES, INC., BRIDGEPORT, NEW JERSEY TERMINAL. It is not known if all samples were processed through the EPA Contract Laboratory Program utilizing prescribed QA/QC programs to review the data before use. Some soil and groundwater samples exceeded the recommended holding times before analysis. The effect, if any, of the sample time exceedence on the actual concentration is not known.

B. ENVIRONMENTAL PATHWAYS

Groundwater: Two major hydrogeologic units exist in the vicinity of the CLTL Site. These are: (1) A lower hydrogeologic unit which occurs approximately 240 feet below the land surface and is confined below by the Wissihickon Formation and above by continuous clay units approximately 65

feet in thickness. (2) An upper hydrogeologic unit consisting of the upper 150 feet (approximately) of the Potomac Group-Raritan Formation and the thin veneer, if present, of the overlying Cape May Formation.

Three water-bearing subzones were identified in the upper hydrogeologic unit in which monitoring wells and private wells were placed. These subzones are: (1) A shallow subzone occurring between the ground surface and 30 feet below the surface. (2) An intermediate subzone occurring approximately 25 to 100 feet below the land surface. (3) A deep subzone occurring approximately 100 to 150 feet below the land surface.

The on-site groundwater is contaminated with levels of VOCs, semi-VOCs, pesticides, inorganic compounds, and metals. The extent of total VOCs, total semi-VOCs, inorganic compounds, metals and total pesticide contamination found in the subzones are: (1) The deep subzone contamination consisted of total VOCs (40 ug/l, maximum), chromium (60 ug/l, maximum), zinc (1,700 ug/l, maximum) and total pesticides (0.21 ug/l, maximum), (2) For the intermediate subzone, the extent of contamination found consisted of total VOCs (75,600 ug/l, maximum), semi-VOCs (2,200 ug/l, maximum), arsenic (1,230 ug/l, maximum), lead (3,500 ug/l, maximum), zinc (5,840 ug/l, maximum) and total pesticides (0.39 ug/l, maximum), (3) The extent of contamination found in the shallow subzone consisted of total VOCs (22,400 ug/l, maximum), total semi-VOCs (5,300 ug/l, maximum), arsenic (190 ug/l, maximum), chromium (690 ug/l, maximum), lead (650 ug/l, maximum), zinc (68,500 ug/l, maximum) and total pesticides (1.1 ug/l, maximum). The on-site groundwater contaminants of concern, chosen by the CLTL contractor using EPA procedures, are given in Table 1 and consist of VOCs, inorganic compounds and metals. CLTL has a groundwater production well for water usage in the tanker truck washing and cleaning operations. The production well is located on-site and obtains water from the contaminated portion of the aquifer. The production well contamination results are given in the Appendix, Table 3.

The off-site groundwater contaminants of concern are given in Table 2. These values were obtained from residential potable water supply wells in the vicinity of the CLTL Site. As previously noted, residents north of the site along Route 44 were connected to the Bridgeport Water System in 1987.

Surface and Subsurface Soil: An examination of the surface and subsurface soil data indicated contamination by VOCs, semi-VOCs, inorganic compounds, metals, and pesticides. The surface soil did not appear to be contaminated at levels of concern. This pathway was not considered further. An evaluation of the subsurface soil data (see Appendix, Table 4) indicated that some samples contained arsenic, cadmium, chromium, and lead at concentrations of 453 mg/kg, maximum, 36.3 mg/kg, maximum, 76 mg/kg, maximum, and 838 mg/kg, maximum respectively. Trichloroethene and chlorobenzene (both VOCs) were found at 290 mg/kg, maximum and 53 mg/kg,

maximum, respectively. Naphthalene, butyl benzyl phthalate and bis(2-ethylhexyl)phthalate (all semi-VOCs) were found at 301 mg/kg, maximum, 359 mg/kg, maximum and 600 mg/kg, maximum, respectively. A limited soil gas investigation was conducted around the "Trew" residence, the area north of the employee parking area, and two background areas. The "clean" background area registered 51.4 ppm on an organic vapor analyzer (OVA). A gas sample around the residence registered 109 ppm on the OVA. The 109 ppm reading was attributed to a septic tank system near where the sample was taken. Other readings were attributed to naturally occurring methane gas.

C. HUMAN EXPOSURE PATHWAYS

The human exposure pathways identified for the CLTL Site are inhalation of contaminated air or contaminated fugitive dust, inadvertent ingestion of contaminated surface and subsurface soil, and dermal absorption of contaminants by contact with groundwater.

The inhalation of contaminated air would occur from the volatilization of VOCs from water used in the tank truck washing operations, from the 50,000-gallon above-ground holding tank, and from the 3,000-gallon settling tank used in current operations. A past inhalation pathway would have resulted from the residential use of contaminated groundwater during showering. Employees of CLTL would be exposed to VOCs while engaging in tanker washing activities. No ambient air samples were taken during these activities. Regarding the past use of contaminated groundwater during showering, a water line was extended to the residents along Route 44 north of the site in 1987, thereby eliminating the inhalation exposure pathway for these residents.

The inhalation of contaminated fugitive dust may occur from dust generating activities on surface or subsurface soils. The surface soil environmental pathway was discussed earlier and dismissed. The contaminant concentrations that were found were not at levels of concern. A dust suppressant is also used on the site. The subsurface soils, though contaminated with metals, VOCs, and semi-VOCs, are not normally accessible unless disturbed through construction or remedial activities.

Inadvertent ingestion of surface and subsurface soil by adults could occur during remedial or construction activities from eating, smoking, nail biting, etc. Subsurface soils are contaminated with VOCs, semi-VOCs, and metals. The areas of heavy contamination appear to be sporadic in nature and the range of contaminant concentrations is variable. Because the site is in an industrial setting and the site is fenced, children are not expected to be exposed to site soil contaminants. On-site surface soil contamination was noted earlier not to be at levels of concern.

Another exposure pathway was dermal absorption of contaminants from the use of contaminated groundwater. However, as noted previously, municipal

water has been supplied to the most seriously affected residents north of the site thereby eliminating this exposure pathway. After the late 1970's and prior to completion of the water line in 1987, bottled water was used for potable purposes by the affected residents requesting this service from CLTL. Presumably, groundwater was used during this interim period for other household activities such as washing dishes, bathing, showering, and washing clothes.

PUBLIC HEALTH IMPLICATIONS

On-site groundwater is highly contaminated with several VOCs including trans-1,2-dichloroethene (DCE), vinyl chloride, and trichloroethene (TCE). The contamination has migrated off site and has been detected in private groundwater wells to the north of the site. The owners of the private wells have been provided with bottled water for potable use since the contamination was discovered in the late 1970s. However, these wells were apparently still used for showering, washing, and other non-potable purposes. In 1987, the homes north of Route 44 were connected to the Bridgeport Municipal Water System.

Of the contaminants that were detected in off-site private wells, vinyl chloride was present at the highest concentration. In epidemiological studies, occupational exposure to vinyl chloride has been associated with an increased incidence of liver tumors (angiosarcomas) as well as tumors at other body locations. Based on animal experiments, it has been suggested that the developing fetus and neonates are particularly sensitive to the carcinogenicity of vinyl chloride. Noncarcinogenic toxic effects that may occur upon exposure to vinyl chloride include hepatotoxicity and central nervous system disturbances. In addition, epidemiological studies have suggested an association between occupational exposure to vinyl chloride in men and an increased incidence of fetal loss in their wives.

The use of water containing vinyl chloride and other VOCs inside a house for showering, clothes washing, etc. can lead to the release of these volatile compounds to the air. Residents would then be exposed to these chemicals by inhalation of indoor air. In addition, dermal absorption of the contaminants could also occur during bathing and other direct contact with the water. An assessment of potential health effects resulting from past VOC exposure from non-potable water use within the home cannot be determined because of the absence of exposure data. However, the maximum water concentrations of vinyl chloride, TCE, and DCE detected in residential wells (Table 2) exceeded acceptable health-based values. Furthermore, the presence of multiple contaminants in a water source can lead to enhanced toxicity as the result of additive or synergistic effects on the same organ system (e.g., liver). The use of off-site groundwater containing the maximum detected concentrations of VOCs for either potable and non-potable purposes within the home could pose an appreciable health risk.

It was reported that the homes were connected to the public water system in 1987. Therefore, there is currently no known residential use of contaminated groundwater for potable or non-potable purposes.

The contaminated on-site production well is used for tank trailer washing operations. Workers could be exposed to VOCs released from the water during these operations, as well as from residual chemicals flushed out of the tank trailers during washing procedures. Direct worker contact with groundwater and rinse water could also result in dermal absorption of some contaminants. On-site work practices are regulated by the Occupational Safety and Health Administration (OSHA). The health and safety of workers should be protected by complying with all applicable OSHA regulations.

No air monitoring data were provided to indicate whether there are appreciable concentrations of VOCs in on-site or off-site ambient air. Therefore, no assessment of potential health effects from this exposure pathway for on-site or off-site receptors can be offered.

The on-site surface soil contamination reported in the RDRI report would not be expected to pose an appreciable health risk to workers. However, subsurface soils in the former lagoon areas were highly contaminated. If these soils were excavated during remediation or construction activities, appreciable human exposures to contaminants could occur.

It is possible that contamination from the site has entered Cedar Swamp, Moss Branch, Cooper Lake, and other off-site areas surrounding the site. No information on these areas was presented in the RDRI report. This information is needed in order to evaluate the potential health impact of the site on off-site receptors.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS:

This site is of potential health concern because of the risk to human health resulting from possible exposure to hazardous substances at concentrations that may result in adverse health effects. As noted in the Human Exposure Pathways Section above, human exposure to VOCs from groundwater may occur, be occurring, or have occurred via inhalation and dermal absorption. Human exposure to VOCs, semi-VOCs, and heavy metals in subsurface soil may also occur via inhalation, ingestion, and dermal absorption if these soils were unearthed.

Contamination on the CITL Site exists primarily in the groundwater and subsurface soils. Groundwater contamination has impacted nearby residential wells. However, the extension of the municipal water mains to residents north of the site has eliminated their inhalation, dermal absorption and ingestion exposures to groundwater contaminants.

Employees of CLTL engaging in tank trailer washing operations may be exposed to VOCs by the inhalation of volatilized groundwater contaminants. Residents in the vicinity of the site may also be exposed to fugitive VOCs from the tank trailer washing operations. No on-site or off-site air data were available to assess these potential pathways. The on-site subsurface soils are contaminated with VOCs, semi-VOCs, heavy metals, and pesticides. Human exposure via ingestion, inhalation and dermal absorption of subsurface soil contaminants may occur during remediation or construction activities. Surface soil contaminants were not at concentrations that would be expected to be of health concern. Additional investigations are needed to characterize adequately the contamination of the off-site wetlands areas.

RECOMMENDATIONS:

1. If there are private wells near the site that are still being used for potable or non-potable purposes, they should be regularly monitored for contamination. Institutional controls should be implemented to prevent well installations for potable or non-potable use in the contaminated portions of the aquifers.

2. Ambient air monitoring while the facility is in operation is needed in order to determine whether air concentrations of VOCs are of health concern to on-site workers and nearby residents.

3. Continue with the preparation of the wetlands assessment and the surface water and sediment investigations. Further information is needed on whether there is consumption of animals, consumable wild plants, crops, and livestock that may be potentially contaminated by surface and groundwaters. Data on bioaccumulation of contaminants in fish and the degree of fishing in the vicinity of the site is needed to determine the extent and level of exposure.

4. It is recommended that potential worker exposure to contamination be minimized by wearing of protective clothing, washing after contact with contaminated water, and following all applicable Occupational Safety and Health Administration (OSHA) regulations for personal protection. Optimal dust control measures should be implemented, and appropriate monitoring at the worksite periphery should be conducted for the protection of nearby residents during remedial activities.

5. In accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) as amended, the Chemical Leaman Tank Lines, Inc. NPL Site, Logan Township, Gloucester County, New Jersey has been evaluated for appropriate follow-up with respect to health effects studies. Inasmuch as there is no extant documentation or indication in the information and data reviewed for this Health Assessment that human exposure to on-site or off-site contaminants is currently occurring or has occurred in the past, this site is not being considered for follow-up health studies at this time. However, if data become

available suggesting that human exposure to significant levels of hazardous substances is currently occurring or has occurred in the past, ATSDR will re-evaluate this site for any indicated follow-up.

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REFERENCES

1. Environmental Resources Management, Inc., REVISED DRAFT REMEDIAL INVESTIGATION REPORT, VOLUMES 1 AND 2, CHEMICAL LEAMAN TANK LINES, INC., BRIDGEPORT, NEW JERSEY TERMINAL, (June 7, 1988).

2. Environmental Resources Management, Inc., REVISED DRAFT RISK ASSESSMENT, CHEMICAL LEAMAN TANK LINES, INC., BRIDGEPORT, NEW JERSEY TERMINAL.

3. Environmental Resources Management, Inc., DRAFT REMEDIAL INVESTIGATION REPORT, CHEMICAL LEAMAN TANK LINES, INC., BRIDGEPORT, NEW JERSEY TERMINAL, (December 1986).

4. Environmental Resources Management, Inc., DRAFT RISK ASSESSMENT, CHEMICAL LEAMAN TANK LINES, INC., BRIDGEPORT, NEW JERSEY TERMINAL, (December 1986).

5. Sittig, M., HANDBOOK OF TOXIC AND HAZARDOUS CHEMICALS AND CARCINOGENS, 2nd edition, Park Ridge, NJ, Noyes publications, (1985).

APPENDICES

1. FIGURE 1- Chemical Leaman Tank Lines, Inc., Site Location Map.
2. FIGURE 2- Chemical Leaman Tank Lines, Inc., Site Map
3. TABLE 3- CLTL Production Will Contamination
4. TABLE 4- On-site Subsurface Soil Contamination

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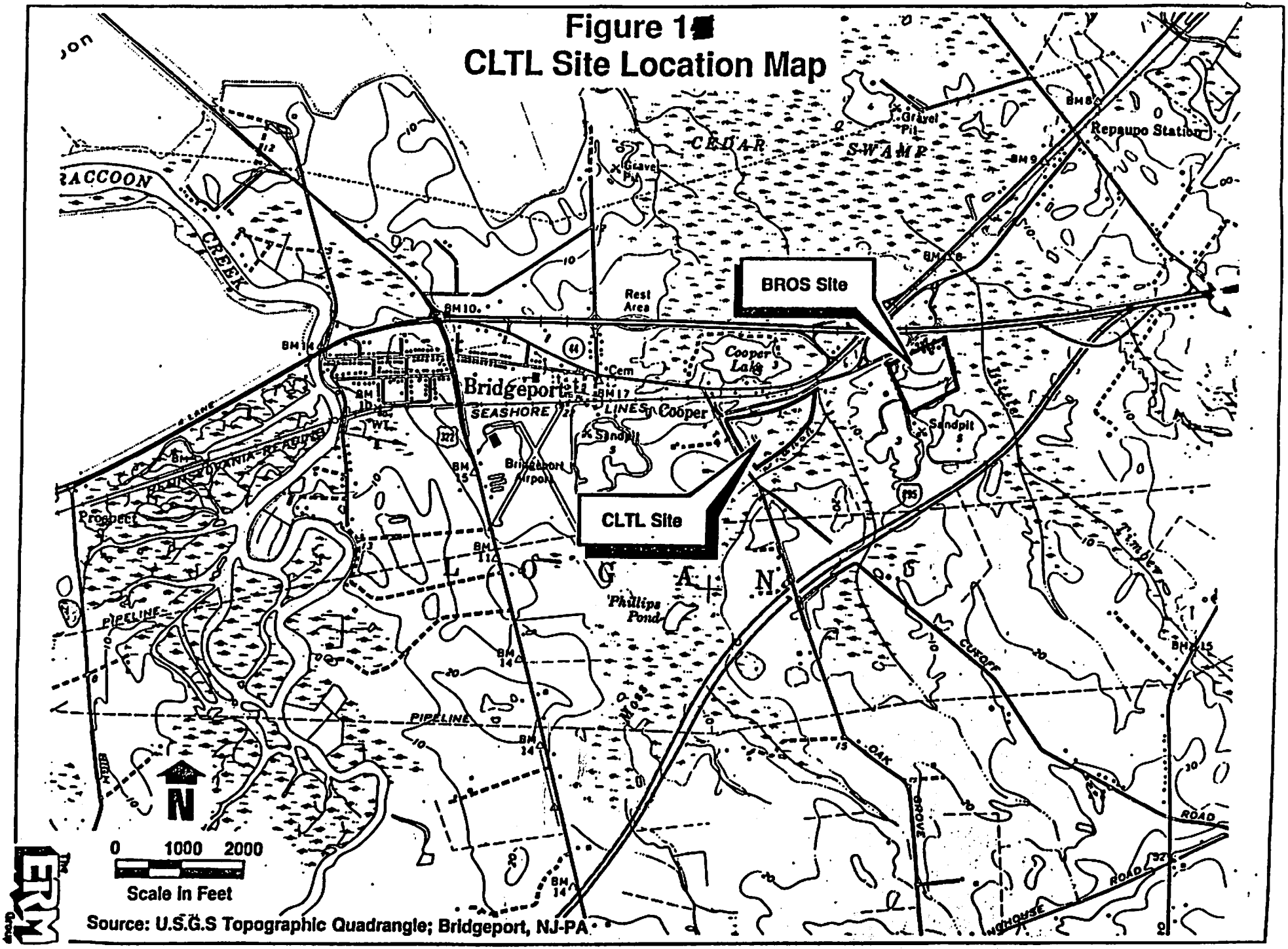
Figure 1
CLTL Site Location Map



Source: U.S.G.S Topographic Quadrangle; Bridgeport, NJ-PA

Figure #2
CLTL Site Map

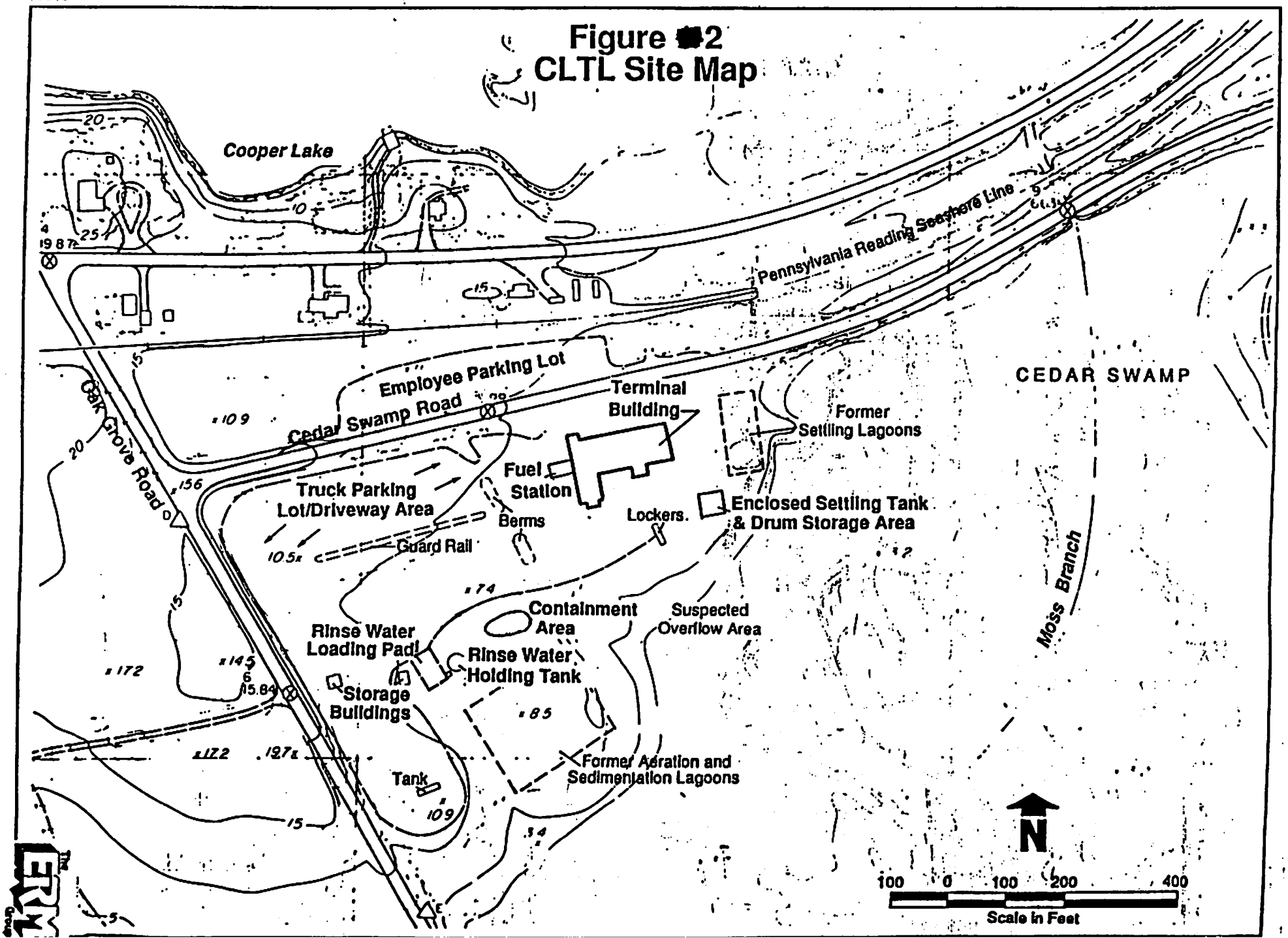


TABLE 3
CHTL PRODUCTION WELL CONTAMINATION
ppm, maximum

CONTAMINANT	
Trichloroethene	1900
Benzene	40
Vinyl chloride	20
Trans-1,2-dichloroethene	2900
Chlorobenzene	10
Methylene chloride	50
1,2-dichloroethane	30
Tetrachloroethane	10

ppm- parts per million

TABLE 4
ON-SITE SUBSURFACE SOIL CONTAMINATION
mg/kg, maximum

CONTAMINANT	
Trichloroethene	290
Benzene	1.16
Vinyl chloride	ND
Trans-1,2-dichloroethene	10
Chlorobenzene	53
Naphthalene	301
Butyl benzyl phthalate	359
Bis(2-ethylhexyl)phthalate	600
Arsenic	453
Cadmium	36.3
Chromium	76
Lead	838
Zinc	1320

mg/kg- milligrams per kilograms